REQUEST FOR RECONSIDERATION

Applicants thank Examiner Kruer for the helpful and courteous discussion of April 7, 2005. During the discussion, Applicants' U.S. representative pointed out that the silane-containing metal/polymer laminates exhibit significantly improved resistance to delamination under corrosive conditions.

Applicants have demonstrated the improved delamination characteristics certain metal/polymer laminates in Table 1 of the specification as originally filed. An invention metal/polymer laminate is compared with a laminate prepared with a conventional adhesive film instead of the silane recited in the present independent claims in the Examples on page 13 of the specification. Table 1 is reproduced below for convenience:

Table 1

	Pull Results (Top/Bottom Skin)	
Days of immersion in salt water	Conventional Film	Test Film RH6496-20
Fresh Pull Results	(19/20) Good cohesive failure	(23/30) Good cohesive failure
3 days 5% NaCl 50°F	(20/27) some edge delamination seen	(29/27) Good cohesive failure
7 days 5% NaCl 50°F	(23/20) some edge delamination seen	(30/27) Good cohesive failure
15 days 5% NaCl 50°F	(5/18) severe edge delamination seen	(28/30) Good cohesive failure

The boxed column represents a metal/polymer laminate of the invention.

In Table 1 the delamination characteristics of the samples is described in terms of the pull force needed to separate the layers (e.g., ##/##). Higher numbers mean that more force is required to pull apart the layers. The delamination characteristics are also described subjectively in terms of the type of failure. A good cohesive failure is one in which the laminate splits through the polymer core. A delamination failure is

one in which the core polymer layer peels from the metal layer along the polymer/metal interface.

As can be seen from Table 1 above, the delamination characteristics provided by a metal/polymer laminate made with a conventional adhesive film (e.g., not a film containing the silane of the present claims (page 14, lines 6-8)) are inferior to the delamination characteristics of a metal/polymer laminate wherein the core thermoplastic material is adhered to the metal layers with the silane of the present claims.

Applicants submit that the data of Table 1 demonstrate that the invention metal/polymer laminate (e.g., encompassed by the claimed invention) provides significantly superior delamination performance in comparison to metal/polymer laminates that do not use a silane for the function of adhering the thermoplastic layer to a metal layer.

Applicants have described metal/polymer laminates that contain at least two metal layers and a core polymer layer between the two metal layers. In one embodiment the metal/polymer laminate has a core polymer layer that includes a thermoplastic polymer and a silane (see independent Claim 1). In another embodiment a metal/polymer laminate includes two adhesive layers that separate the core polymer layer from the metal layers (see independent Claim 12). In a further embodiment a metal/polymer laminate includes two outer metal layers, a core polymer layer and a silane of specific formula on the surfaces of the polymer layer in contact with the metal layers (see independent Claim 23).

The Office appears to have taken the position that the claimed metal/polymer laminates are obvious in view of one or more combinations of prior art references. In a first instance the Office rejected the claims as obvious in view of patents to Vincent

(U.S. 3,437,536) and Matsuura (U.S. 4,412,042). In second and third instances the Office rejected the claims as obvious in view of either Newman (U.S. 4,313,996) or Weber (U.S. 3,467,569) in combination with Matsuura.

It appears that the Office's basis for asserting that the presently claimed subject matter is obvious is (i) Vincent's, Weber's, or Newman's disclosure of metal/polymer laminates, taken in combination with (ii) Matsuura's disclosure of a mixture of a polymer and a silane.

The Office's basis for combining the references appears to rest in Matsuura's disclosure that the prior art thermoplastic/silane mixture may provide good heat resistance and elongation properties. The properties of the prior art thermoplastics may be related to the "cross-linked" structure of the prior art polyolefins (see title of Matsuura). Matsuura does not however disclose that improved adhesion characteristics may be obtained from the prior art cross-linked polyolefins.

Applicants submit that those of ordinary skill in the art may not be motivated to use the thermoplastics of Matsuura as the core material of a metal/polymer laminate because Matsuura's cross-linked polymer may not provide be able to provide desirable adhesion characteristics because the silane is "tied-up" (e.g., chemically bonded) as a cross linking unit between polymer molecules and cannot therefore act to bond the polymer of the core polymer layer with the metal surface of the metal layers. Thus instead of being available to bond with the metal surface the prior art silane is bonded in the prior art thermoplastic matrix.

Applicants submit that that cross-linking between a polymer material and an activated substrate surface (e.g., a metal layer) may provide improved adhesion, this type of cross-linking is not possible in Matsuura because the silane component is dedicated to cross-linking in the polymer matrix. Matsuura discloses preparing a

polyolefin material that is cross-linked with itself and not bonded or cross-linked with a functionalized substrate surface. For example, in the Examples of Matsuura the prior art cross-linked polyolefin material is made by first polymerizing a mixture of monomers to form a copolymer. The copolymer is extruded in the presence of a silane such as vinyl trimethoxysilane to form a mixture which is then mixed to form a catalyst master batch. Cross-linking is carried out by submerging a molded plate of the copolymer/silane/master batch mixture in water at elevated temperature. The cross-linking occurs intramolecularly in the polymer matrix and not between an activated substrate surface and the prior art polymer mixture. Because Matsuura cross-links the polymer to form a cross-linked polymer matrix, further cross-linking may not occur if the Matsuura polymer matrix is contacted with, for example, a metal layer.

In contrast with Matsuura's cross-linked polymer/silane mixtures which have intramolecular cross-linking, the claimed metal/polymer laminate exhibits improved adhesion between the polymer core and the metal layers. Applicants submit that this improved adhesion is due to chemical interactions between the metal layer, silane and the core polymer layer.

Thus the silane of the present claims carries out a different function than the silane of the Matsuura compositions.

Applicants submit the Office did not take this difference into consideration in the Office Action of March 15, 2005. Applicants submit that the Office merely assembled a collection of the claim limitations from different references and using hindsight concluded that the claimed invention is obvious. Applicant submit that those of ordinary skill in the art would have no reasonable expectation of successfully preparing a metal/polymer laminate exhibiting improved delamination characteristics

using the compositions of Matsuura in the laminates of Weber or Vincent or Newman because the prior art matrix bonded silane may not be able to improve the adhesion between the metal layer and the thermoplastic polymer core to the degree possible by the claimed invention.

Applicants draw the Office's attention to original Claim 34 and new Claims 37 and 40 which require that the claimed metal polymer laminate is obtained by applying the silane onto at least one surface of each metal layer to form a silane-coated metal surface and then contacting the different surfaces of the core polymer layer with each of the silane-coated metal surfaces. Applicants submit the subject matter of Claims 34, 37 and 40 is novel and not obvious in view of the prior art cited by the Office. As was mentioned above, Matsuura discloses polymer mixtures that contain a silane dispersed therein. It is stated in Matsuura that the prior art silane functions to cross-link the prior art polymer. Claims 34, 37 and 40 are prepared by contacting the core polymer layer with the silane-covered surfaces of the metal layers. Applicants submit that bonding between the metal surfaces and the polymer surface of Claims 34, 37 and 40 can not occur in Matsuura because the prior art silane is present in the polymer matrix and not on the surfaces of the metal layers and therefore the prior art silane does not bond (e.g., connect) the core polymer matrix with the metal surfaces.

Applicants further draw the Office's attention to new dependent Claims 36, and 41-44 wherein the core polymer layer is required to be free of silane. Applicants submit that the subject matter of new dependent Claims 36, and 41-44 is novel and not obvious over the prior art relied upon by the Office because the prior art (e.g., Matsuura) describes a polymer layer that comprises a silane dispersed therein.

The Office notes that Newman discloses that the polymer material of the prior art metal/polymer laminate may be adhered to a metal layer with an adhesive layer.

The adhesive layer of Newman is disclosed at column 3, lines 8-58. The Newman adhesive is described as one that is polymer-based and modified with monomers "having reactive carboxylic acid groups" (column 3, lines 15-18). Newman does not disclose or suggest the use of silanes to improve adhesion between a metal layer and a thermoplastic polymer core.

Likewise, the Office notes that Weber may teach the use of a backing layer between a metal layer and a resin foam layer. Weber does not disclose the use of a silane to improve adhesion between the metal and thermoplastic layers.

Applicants therefore submit that the prior art cited by the Office is not sufficient for supporting a *prima facie* case of obviousness against the present claims. Applicants submit the Office has used hindsight to assembly a collection of the claimed elements from the prior art disclosure without taking into consideration the prior art's silence which regards to the functional of a silane material required in the present claims.

Applicants therefore submit that the presently claimed invention is not obvious in view of the cited prior art and respectfully request the withdrawal of the rejections.

Respectfully submitted,

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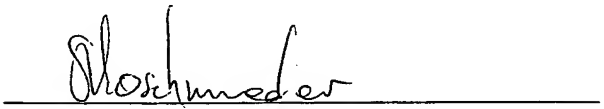

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